

Chapter 4. IFR

Section 1. NAVAID Use Limitations

4-1-1. ALTITUDE AND DISTANCE LIMITATIONS

When specifying a route other than an established airway or route, do not exceed the limitations in the table on any portion of the route which lies within controlled airspace. (For altitude and distance limitations, see TBL 4-1-1, TBL 4-1-2, TBL 4-1-3, and TBL 4-1-4.) (For correct application of altitude and distance limitations see FIG 4-1-1 and FIG 4-1-2.)

REFERENCE-

FAAO 7110.65, *Fix Use*, Para 4-1-5.

FAAO 7110.65, *Methods*, Para 5-6-2.

VOR/VORTAC/TACAN NAVAID's Normal Usable Altitudes and Radius Distances

| Class | Altitude | Distance (miles) |
|-------|------------------|------------------|
| T | 12,000 and below | 25 |
| L | Below 18,000 | 40 |
| H | Below 14,500 | 40 |
| H | 14,500 - 17,999 | 100 |
| H | 18,000 - FL 450 | 130 |
| H | Above FL 450 | 100 |

TBL 4-1-1

L/MF Radio Beacon (RBN) Usable Radius Distances for All Altitudes

| Class | Power (watts) | Distance (miles) |
|-------|---------------|------------------|
| CL | Under 25 | 15 |
| MH | Under 50 | 25 |
| H | 50 - 1,999 | 50 |
| HH | 2,000 or more | 75 |

TBL 4-1-2

ILS Usable Height and Distance*

| Height (feet) above transmitter | Distance (miles from transmitter) |
|---------------------------------|-----------------------------------|
| 4,500 | 10 (for glideslope) |
| 4,500 | 18 (for localizer) |

*Use the current flight check height/altitude limitations if different from the above minima.

TBL 4-1-3

MLS Usable Height and Distance*

| Height (feet) above transmitter | Distance (miles from transmitter) |
|---------------------------------|-----------------------------------|
| 20,000 | 20 (for glideslope) |
| 20,000 | 20 (for azimuth) |

*Use the current flight check height/altitude limitations if different from the above minima.

TBL 4-1-4

Application of Altitude and Distance Limitations [Application 1]

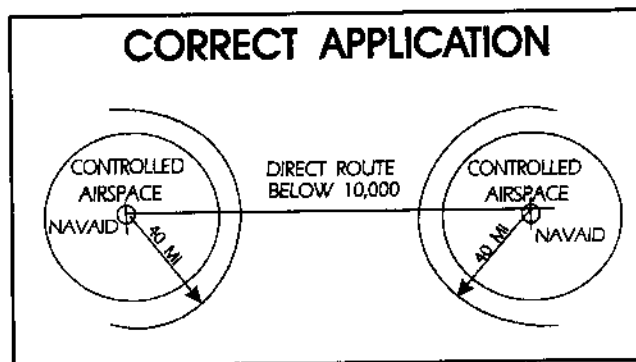


FIG 4-1-1

Application of Altitude and Distance Limitations [Application 2]

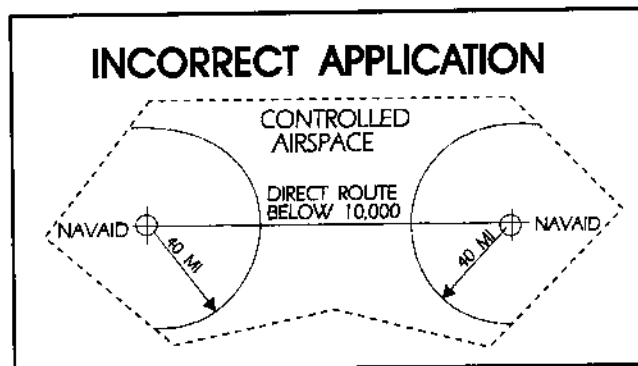


FIG 4-1-2

4-1-2. EXCEPTIONS

Altitude and distance limitations need not be applied when any of the following conditions are met:

a. Routing is initiated by ATC or requested by the pilot and the following is provided:

1. Radar monitoring.

2. As necessary, course guidance unless the aircraft is /E, /F, or /G equipped.

NOTE-

1. Para 4-4-1, Route Use, requires radar monitoring be provided at FL 450 and below to aircraft on random (impromptu) RNAV routes.

Para 5-5-1, Application, requires radar separation be provided for these routes at FL 450 and below.

2. When a clearance is issued beyond the altitude and/or distance limitations of a NAVAID, in addition to being responsible for maintaining separation from other aircraft and airspace, the controller is responsible for providing aircraft with information and advice related to significant deviations from the expected flight path.

REFERENCE-

P/CG Term - Radar Monitoring.

b. Operational necessity requires and approval has been obtained from the Frequency Management and Flight Inspection Offices to exceed them.

c. Requested routing is via an MTR.

REFERENCE-

FAAO 7110.65, Methods, Para 5-6-2.

4-1-3. CROSSING ALTITUDE

Use an altitude consistent with the limitations of the aid when clearing an aircraft to cross or hold at a fix.

REFERENCE-

FAAO 7110.65, Methods, Para 5-6-2.

4-1-4. VFR-ON-TOP

Use a route not meeting service volume limitations only if an aircraft requests to operate "VFR-on-top" on this route.

NOTE-

Aircraft equipped with TACAN only are expected to:

a. Define route of flight between TACAN or VORTAC NAVAID's in the same manner as VOR-equipped aircraft.

b. Except in Class A airspace, submit requests for "VFR-on-top" flight where insufficient TACAN or VORTAC NAVAID's exist to define the route.

REFERENCE-

FAAO 7110.65, Methods, Para 5-6-2.

4-1-5. FIX USE

Request aircraft position reports only over fixes shown on charts used for the altitude being flown, except as follows:

NOTE-

Waypoints filed in random RNAV routes automatically become compulsory reporting points for the flight unless otherwise advised by ATC.

a. Unless the pilot requests otherwise, use only those fixes shown on high altitude en route charts, high altitude instrument approach procedures charts, and DP charts when clearing military turbojet single-piloted aircraft.

b. Except for military single-piloted turbojet aircraft, unpublished fixes may be used if the name of the NAVAID and, if appropriate, the radial/course/azimuth and frequency/channel are given to the pilot. An unpublished fix is defined as one approved and planned for publication which is not yet depicted on the charts or one which is used in accord with the following:

REFERENCE-

FAAO 7130.3, Holding Pattern Criteria.

1. Unpublished fixes are formed by the en route radial and either a DME distance from the same NAVAID or an intersecting radial from an off-route VOR/VORTAC/TACAN. DME shall be used in lieu of off-route radials, whenever possible.

2. Except where known signal coverage restrictions exist, an unpublished fix may be used for ATC purposes if its location does not exceed NAVAID altitude and distance limitation, and when off-route radials are used, the angle of divergence meets the criteria prescribed below.

NOTE-

Unpublished fixes should not negate the normal use of published intersections. Frequent routine use of an unpublished fix would justify establishing a fix.

REFERENCE-

FAAO 7110.65, Altitude and Distance Limitations, Para 4-1-1.

3. Do not hold aircraft at unpublished fixes below the lowest assignable altitude dictated by terrain clearance for the appropriate holding pattern airspace area (template) regardless of the MEA for the route being flown.

4. When the unpublished fix is located on an off-route radial and the radial providing course guidance, it shall be used consistent with the following divergence angles:

(a) When holding operations are involved with respect to subparas (b) and (c) below, the angle of divergence shall be at least 45 degrees.

(b) When both NAVAID's involved are located within 30 NM of the unpublished fix, the minimum divergence angle is 30 degrees.

(c) When the unpublished fix is located over 30 NM from the NAVAID generating the off-course radial, the minimum divergence angle shall increase 1 degree per NM up to 45 NM; e.g., 45 NM would require 45 degrees.

(d) When the unpublished fix is located beyond 45 NM from the NAVAID generating the off-course radial, the minimum divergence angle shall increase $\frac{1}{2}$ degree per NM; e.g., 130 NM would require 88 degrees.

c. Fixes contained in the route description of MTR's are considered filed fixes.

d. TACAN-only aircraft (type suffix M, N, or P) possess TACAN with DME, but no VOR or LF navigation system capability. Assign fixes based on TACAN or VORTAC facilities only.

NOTE-

TACAN-only aircraft can never be held overhead the NAVAID, be it TACAN or VORTAC.

e. DME fixes shall not be established within the no-course signal zone of the NAVAID from which inbound holding course information would be derived.

REFERENCE-

FAAO 7110.65, NAVAID Fixes, Para 2-5-3.

FAAO 7110.65, Methods, Para 5-6-2.